International Journal on Advanced Science Engineering Information Technology

Vol.7 (2017) No. 5
ISSN: 2088-5334

Natural Lime Treated as Partial Cement Replacement to Produce Concrete

Tan Yeong Yu[#], Doh Shu Ing[*], Chin Siew Choo[*], Muhammad Aizat Azed[*]

[#]*Master Student in Faculty of Civil Engineering and Earth Resources, University Malaysia Pahang, 26300 Kuantan, Malaysia*
E-mail: tanyeongyu@gmail.com

[*]*Faculty of Civil Engineering and Earth Resources, University Malaysia Pahang, 26300 Kuantan, Malaysia*
E-mail: dohsi@ump.edu.my, scchin@ump.edu.my

***Abstract*— In this study, the eggshell powder was used as partial replacement of Ordinary Portland cement replacement at 5%, 10%, 15% and 20% in concrete production. Since the chemical compositions of eggshell contain mainly of calcium oxide which is mostly similar to the natural lime sources. Thus the use of waste-products in cement industries is an environmental friendly while able to increase the industrialization instead of disposal of large numbers of waste materials that would pollute the land, water, and air. The specimens were casted into concrete cube (100mm x 100mm x100mm) and beam (100mm x100mm x 500mm). The investigations focused on compressive, flexural strength and water absorption at different percentages of replacement and tested at 1, 7, 28, 56 and 90 days. From the investigation, it is found that the compressive strength and flexural strength increases up to 45% as compared to the control specimens when cement replacement by 15% of air-dry eggshell powder. Moreover, the rate of water absorption greatly reduces 55% when cement replacement by 15% of air-dry eggshell powder. Scanning electron microscope showed a clear picture of the eggshell concrete contains fewer voids than normal plain concrete.**

***Keywords*— eggshell powder; partial cement replacement; compressive strength; flexural strength; water absorption; scanning electron microscope**